

## REMARKS

By this amendment, claim 9 has been cancelled, claims 5, 27, 31, 35, and 41 have been amended, and new claims 45-46 has been added. Accordingly, claims 5-8, 10-27, 29-36, and 38-46 are pending in the present application. The claim amendments are supported by the specification, the accompanying figures, and claims as originally filed, with no new matter being added. In particular, support for new claim 45 can be found in Figure 10 and from page 22, line 21 to page 24, line 6 of the application as filed. Support for the amendments to claims 27, 31, and 35 can be found in the application as filed at page 17, lines 1-13. Accordingly, favorable reconsideration of the pending claims is respectfully requested.

1. Rejections Under 35 U.S.C. §102

Claims 5-9, 11, 12, 15, 16, 17-26, 41, 43, and 44 have been rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 5,980,767 to Koshimizu et al. (hereinafter ("*Koshimizu*") for the reasons set forth on pages 2-4 of the Office Action. Applicants respectfully traverse.

Independent claim 5 recites, *inter alia*:

wherein said pulsing is applied so that said at least one gas does not reach steady state concentration within said etch chamber in said plurality of periods

And, independent claim 41 recites, *inter alia*:

wherein said pulsing is applied so that said carbon containing polymer gas does not reach steady state concentration within said etch chamber in said plurality of periods

Figures 12A and 12B of the present application illustrate this non-steady state pulsing. As stated in the specification in the paragraph beginning at page 25, line 21:

The solid lines in Figs. 12A and 12B do not superimpose with the respective dashed lines. This feature indicates that under these pulsing conditions the medium within the chamber does not reach steady state conditions. As shown by the solid lines in Figs. 12A and 12B, the transition time between state 1 and state 2 conditions is a significant fraction of the period, and the chamber operates under non steady state conditions for approximately all the time. Figures 12A and 12B illustrate an example of fast pulsing conditions in an embodiment of the present invention in which the system does not reach steady state conditions for any of the states 1 or 2.

Therefore, a careful reading of present claim 9 reveals what is taught in the specification, that the pulsing recited in claim 9 operates so that the gas does not reach steady state conditions since "the chamber operates under non steady state conditions for approximately all the time." *Id.* Thus, the limitation of claim 9 regarding non-steady state conditions is not taught or suggested by *Koshimizu*, and the prompt removal of the rejection of claim 9 is therefore respectfully requested.

In contrast, *Koshimizu* teaches pulsing wherein the concentration within the etch chamber reaches steady state at least once in a give plurality of periods. *See Koshimizu*, Figures 50-53. This steady state period is depicted as the period of time when the pulse is level either at its maximum or minimum.

Applicants therefore respectfully assert that claims 5 and 41 are patentable over *Koshimizu*. Claims 5-8, 11, 12, 15, 16, 17-26, 43, and 44 depend from either claim 5 or claim 41, include the limitations therein, and are therefore also patentable over *Koshimizu* for at least the foregoing reasons discussed with respect to claims 5 and 41.

Claims 27, 29, 30, 35, 36, 38, and 39 have been rejected under 35 U.S.C. § 102(e) as being anticipated by *Koshimizu* for the reasons set forth on pages 4-5 of the Office Action. Applicants respectfully traverse.

Present claim 27 recites, *inter alia*:

wherein said hydrofluorocarbon gas is at least intermittently at a wherein said hydrofluorocarbon gas is pulsed in a range from about 0 sccm to about 25 sccm and is at least intermittently at a higher concentration than said fluorocarbon gas;

said hydrofluorocarbon gas removes portions of said oxide;  
and

said fluorocarbon gas forms a protective layer;

Present claim 35 recites, *inter alia*: "wherein said etchant gas is at least intermittently at a higher concentration than said polymer forming gas."

*Koshimizu* does not teach or suggest the above-cited limitations of claims 27 and 35. For example, in Figures 50-53, *Koshimizu* clearly shows that the  $\text{CF}_4$  gas is always at an equal or higher concentration than the  $\text{CHF}_3$  gas.

Claims 29, 30, 36, 38, and 39 depend from claim 27 or claim 35 and include the limitations therein. Therefore, claims 29, 30, 36, 38, and 39 are patentable over *Koshimizu* for at least the foregoing reasons presented with respect to claims 27 and 35.

## 2. Rejections Under 35 U.S.C. §103

Claims 31-34 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over *Koshimizu* in view of *Corn* for the reasons set forth on pages 6-7 of the Office Action. Applicants respectfully traverse

Present claim 31 recites, *inter alia*, "wherein said second gas is at least intermittently at a higher concentration than said first gas." For the reasons presented hereinabove with respect to claims 27 and 35, *Koshimizu* does not teach or suggest this limitation of claim 31. *Corn* cannot cure the deficiencies of *Koshimizu*.

Claims 32-34 depend from claim 31 and include the limitations therein. Therefore, claims 32-34 are patentable over *Koshimizu* in view of *Corn* for at least the foregoing reasons presented

with respect to claim 31.

Claims 10, 13, and 14 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over *Koshimizu* in view of U.S. Patent No. 4,585,516 to Corn et al. ("*Corn*") for the reasons set forth on pages 5-6 of the Office Action. Claim 40 has been rejected under 35 U.S.C. § 103(a) as being unpatentable over *Koshimizu* in view of U.S. Patent No. 6,164,295 to Ui et al. ("*Ui*") for the reasons set forth on page 8 of the Office Action. Claim 42 has been rejected under 35 U.S.C. § 103(a) as being unpatentable over *Koshimizu* in view of U.S. Patent No. 4,786,352 to Benzing ("*Benzing*") for the reasons set forth on page 8 of the Office Action. Applicants respectfully traverse.

Claims 10, 13, and 14, 40, and 42 depend from claim 5, 35, or 41 and includes the respective limitations therein. *Corn*, *Ui*, and *Benzing* do not cure the deficiencies of *Koshimizu* with respect to claim 5, 35, and 41. Therefore, claims 10, 13, 14, 40, and 42 are patentable over the cited references for at least the foregoing reasons presented with respect to claim 5, 35, and 41.

Applicants therefore request that the rejection of the claims under 35 U.S.C. § 103(a) be promptly removed.

### 3. New Claims

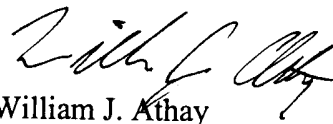
New claim 45 and 46 has been added to recite an additional patentable embodiment of the invention. By way of example only, one portion of new claim 45 that is not taught or suggested in the cited prior art recites, *inter alia*: "wherein the pulsing enables the selection of flow rates from within a second process window that is larger than the first process window while still providing the desired etch profile in the microelectronics substrate." Accordingly, the prompt allowance of these claims is respectfully requested.

CONCLUSION

In view of the foregoing, Applicants respectfully request favorable reconsideration and allowance of the present claims. In the event the Examiner finds any remaining impediment to the prompt allowance of this application that could be clarified by a telephone interview, the Examiner is respectfully requested to contact the undersigned attorney.

Dated this 31st day of January 2003.

Respectfully submitted,



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